**REMARKS**

Claims 9-11 and 18 are pending in this application. By this Amendment, claims 9 and 11 are amended and claims 12 and 14-16 are canceled. No new matter is added. Reconsideration and withdrawal of the objection and rejections are respectfully requested.

Support for the amendments can be found in the specification at, for example, page 7, lines 9-15.

Entry of the amendments is proper under 37 C.F.R. §1.116 because the amendments: (a) place the application in condition for allowance (for the reasons discussed herein); (b) do not raise any new issue requiring further search and/or consideration (as the amendments amplify issues previously discussed throughout prosecution); and (c) place the application in better form for appeal, should an appeal be necessary. Entry of the amendments is thus respectfully requested.

Applicants appreciate the courtesies shown to Applicants' representative by Examiner Leyson in the November 9, 2007 personal interview. Applicants' separate record of the substance of the interview is incorporated into the following remarks.

## I. Claim Objections

The Office Action objects to claims 12 and 14-16. Claims 12 and 14-16 are canceled to obviate the objection. Withdrawal of the objection is respectfully requested.

## II. The Claims Define Patentable Subject Matter

The Office Action rejects claims 9-12, 14-16 and 18 under 35 U.S.C. §103(a) over U.S. Patent No. 3,790,654 to Bagley in view of U.S. Patent No. 4,834,640 to Inoue et al. (Inoue), U.S. Patent No. 1,973,428 to Comstock and U.S. Patent No. 5,219,509 to Cocchetto et al. (Cocchetto); and rejects claims 9-12, 14-16 and 18 under 35 U.S.C. §103(a) over Japanese Patent Publication No. 2000-326318 to Ishiguro et al. (Ishiguro) in view of Bagley, Inoue and Cocchetto. These rejections are respectfully traversed.

Independent claims 9 and 11 recite, *inter alia*, "a connection area ratio of the back hole and the cell block being 35 to 65% so as to prevent breakage when being used with the raw material containing SiC." The applied references fail to teach or suggest the recited features of claims 9 and 11.

As discussed during the November 9, 2007 personal interview, the Office Action acknowledges that Bagley fails to disclose a connection area ratio of the back hole and the cell block being 35 to 65%. However, the Office Action alleges that Bagley discloses that the die construction should provide the required strength and rigidity to withstand extrusion pressures without failure or deleterious deformation and that the dimensions of the slits, back holes and cell blocks provide flow control of material to be extruded. The Office Action also alleges that because Bagley teaches the control of the flow of materials to be extruded in view of the physical properties of the material while still maintaining the required strength and rigidity of the die to withstand extrusion pressures, the connection area ratio would have been found due to routine experimentation.

Furthermore, the Office Action asserts that where the only difference between the prior art and the claims is a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device is not patentably distinct from the prior art device.

Applicants respectfully disagree with the Office Action's assertion. First, according to §2144.04 of the MPEP, "If the applicant <u>has demonstrated</u> the criticality of a specific limitation, it would not be appropriate to rely solely on case law as the rationale to support an obviousness rejection."

Bagley discloses a die that "pertains to the art of manufacturing thin-walled honeycomb structures from extrudable material such as ceramic batches, molten glasses, plastics, molten metals, and similar materials which have the property of being able to flow or

plastically deform during extrusion while being able to become sufficiently rigid immediately thereafter so as to maintain structural integrity" (see col. 1, lines 30-36 of Bagley). The Bagley die is merely capable of maintaining rigidity for "extrudable material" and not for hard material containing silicon carbide (SiC) (see Exhibit A).

Secondly, the present application concerns the extrusion of hard materials that contain silicon carbide which would cause the breakage of cell blocks or appearance of cracks when the connection area ratio of the back hole and the cell block is outside the range of 35 to 65% and no breakage of cell blocks and no appearance of cracks occur when the connection area ratio is inside the range of 35 to 65% (see Tables 1-4 of the specification). Because the die's cell blocks are much more susceptible to breakage when the connection area ratio falls outside the range of 35 to 65%, it is critical to have a die containing a back hole and cell block connection area ratio within the range of 35 to 65% to prevent breakage of the cell blocks or appearance of cracks when using hard input material containing silicon carbide (see Table 2 of specification).

Because Bagley only extrudes softer extrudable materials and does not extrude hard materials containing silicon carbide, Bagley would not only perform significantly different from the present application, and Bagley also would not be able to identify the critical connection area ratio through routine experimentation. Thus, the connection area ratio recited in claims 9 and 11 demonstrate unexpected advantages compared to Bagley regarding SiC.

During the personal interview, the Examiner indicated that the recitation of SiC would not be given much patentable weight, because such a recitation is for intended use, not a structure. However, even if so, it should be noted that the configuration recited in claims 9 and 11 are specifically designed for SiC, and thus the connection area ratio recited therein is specifically designed for SiC. Bagley does not concern SiC. Thus, Bagley does not render obvious, during the asserted routine experimentation, the connection area ratio recited in

claims 9 and 11 Ishiguro, Inoue, Comstock and Cocchetto fail to cure the deficiencies of Bagley. Accordingly, the applied references, alone or in any combination, fail to teach or suggest the recited features of claims 9 and 11.

For at least these reasons, independent claims 9 and 11 and the claims dependent therefrom are patentable over the applied references. Withdrawal of the rejection of the claims is respectfully requested.

## III. Non-Statutory Double Patenting

The Office Action provisionally rejects claims 9-12, 14-16 and 18 on non-statutory obviousness-type double patenting over claims 9 and 10 of co-pending U.S. Patent Application No. 10/507,413 in view of Bagley, Inoue and Cocchetto; and further in view of either Comstock or Ishiguro. The co-pending application fails to teach or suggest the criticality of the connection area ratio of the back hole and the cell block being 35 to 65%, as discussed above. Bagley, Inoue, Cocchetto, Comstock and Ishiguro fail to cure the deficiencies of the co-pending application. Withdrawal of the non-obviousness-type double patenting is respectfully requested.

## IV. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of the pending claims are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,

James A. Oliff
Registration No. 27,075

Obert H. Chu
Registration No. 52,744

JAO:OHC/mdw

Attachment:
Exhibit A

Date: November 16, 2007

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**Telephone: (703) 836-6400**

DEPOSIT ACCOUNT USE AUTHORIZATION
Please grant any extension necessary for entry;
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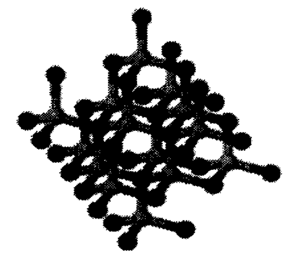
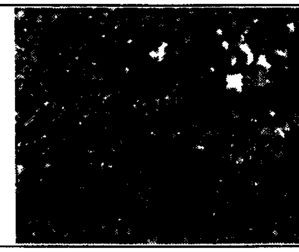
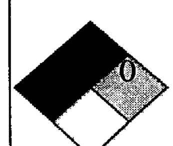
# Silicon carbide

From Wikipedia, the free encyclopedia

**Silicon carbide** (SiC) is a ceramic compound of silicon and carbon that is manufactured on a large scale for use mainly as an abrasive but also occurs in nature as the extremely rare mineral moissanite.

| Silicon carbide | |
|---|---|
|  | |
|  | |
| **Identifiers** | |
| CAS number | 409-21-2 (http://www.emolecules.com/cg bin/search?t=ss&q=409-21-2&c=0&v=) |
| **Properties** | |
| Molecular formula | SiC |
| Molar mass | 40.097 g/mol |
| Appearance | black-green odorless powder |
| Density | 3.22 g/cm³, solid |
| Melting point | 2730°C |
| Solubility in water | insoluble |
| **Hazards** | |
| EU classification | not listed |
| NFPA 704 |  |



Except where noted otherwise, data are given for materials in their standard state (at 25 °C, 100 kPa)
Infobox disclaimer and references

## Contents



## Production

Due to the rarity of natural moissanite, silicon carbide is typically man-made. Most often it is used as an abrasive where it is often known by the trademark **carborundum**, and more recently as a semiconductor and diamond simulant of gem quality. The simplest manufacturing process is to combine silica sand and carbon at a high temperature, between 1600 and 2500 °C.

The material formed in the Acheson furnace varies in purity, according to its distance from the graphite resistor heat

source. Clear, pale yellow and green crystals have the highest purity and are found closest to the resistor. The color changes to blue and black at greater distance from the resistor, and these darker crystals are less pure and usually dope with aluminium or iron, which increases the electrical conductivity of these samples.

Purer silicon carbide can be made by the more expensive process of chemical vapor deposition (CVD). Commercial large single crystal silicon carbide is grown using a physical vapor transport method commonly known as modified Lely method.

Purer silicon carbide can also be prepared by the thermal decomposition of a polymer, poly(methylsilyne), under an inert atmosphere at low temperatures. Relative to the CVD process, the pyrolysis method is advantagous because the polymer can be formed into various shapes prior to thermalization into the ceramic.

# Discovery

The material was manufactured by Edward Goodrich Acheson around 1893, and he not only developed the electric batch furnace by which SiC is still made today but also formed The Carborundum Company to manufacture it in bulk, initially for use as an abrasive. It is said that Acheson was trying to dissolve carbon in molten corundum (alumina) and discovered the presence of hard, blue-black crystals which he believed to be a compound of carbon and corundum: hence carborundum. Or, he named the material "carborundum" by analogy to corundum, which is another very hard substance (9 on the Mohs scale).

### In nature

Naturally occurring **moissanite** is found only in minute quantities in certain types of meteorite and in corundum deposits and kimberlite. Virtually all of the silicon carbide sold in the world, including moissanite jewels, is synthetic. Natural moissanite was first found in 1893 as a small component of the Canyon Diablo meteorite in Arizona by Dr. Ferdinand Henri Moissan, after whom the material was named in 1905. Moissan's discovery of naturally occurring SiC was initially disputed because his sample may have been contaminated by silicon carbide saw blades that were already on the market at that time.

Analysis of SiC grains found in the Murchison carbonaceous chondrite meteorite has revealed anomalous isotopic ratios of carbon and silicon, indicating an origin from outside the solar system and closer to the galactic centre.[1]

# Properties

Silicon carbide exists in at least 70 crystalline forms. Alpha silicon carbide (α-SiC) is the most commonly encountered polymorph; it is formed at temperatures greater than 2000 °C and has a hexagonal crystal structure (similar to Wurtzite). The beta modification (β-SiC), with a face-centered cubic crystal structure (similar to diamond and zincblende or sphalerite), is formed at temperatures below 2000 °C and is shown in the structure at the top of the page Until recently, the beta form has had relatively few commercial uses, although there is now increasing interest in its us as a support for heterogeneous catalysts, owing to its higher surface area compared to the alpha form.

Silicon carbide has a specific gravity of 3.2, and its high sublimation temperature (approximately 2700 °C) makes it useful for bearings and furnace parts. Silicon carbide does not melt at any known pressure. It is also highly inert chemically. There is currently much interest in its use as a semiconductor material in electronics, where its high therm conductivity, high electric field breakdown strength and high maximum current density make it more promising than silicon for high-powered devices. In addition, it has strong coupling to microwave radiation, which together with its

high melting point, permits practical use in heating and casting metals. SiC also has a very low coefficient of thermal expansion and experiences no phase transitions that would cause discontinuities in thermal expansion.

Pure SiC is clear. The brown to black color of industrial product results from iron impurities. The rainbow-like lustre c the crystals is caused by a passivation layer of silicon dioxide that forms on the surface.

# Uses

## Semiconductor

Pure α-SiC is an intrinsic semiconductor with band gaps of 3.28 eV (4H) and 3.03 eV (6H) respectively.

Possibly the earliest electrical application of SiC was in lightning arresters in electric power systems. These devices must exhibit high resistance until the voltage across them reaches a certain threshold $V_T$, at which point their resistanc must drop to a lower level and maintain this until the applied voltage drops below $V_T$.

It was recognized early on that SiC had such a voltage-dependent resistance, and so columns of SiC pellets were connected between high-voltage power lines and the earth. When a lightning strike to the line raises the line voltage sufficiently, the SiC column will conduct, allowing the worst of the stroke to pass harmlessly to the earth instead of along the power line. Unfortunately, such SiC columns proved to conduct significantly at normal power-line operating voltages and thus had to be placed in series with a spark gap. This spark gap is ionized and rendered conductive when lightning raises the voltage of the power line conductor, thus effectively connecting the SiC column between the powe conductor and the earth, where it then operates as before.

The trouble here is that spark gaps used in lightning arrestors are notoriously unreliable: they either fail to strike an arc when needed or fail to turn off afterwards: this last is due to material failure or contamination by dust or salt. In fact, the whole idea of using the SiC column was to eliminate the need for the spark gap in a lightning arrester.

But with some intensive engineering, the gapped SiC lightning arrester proved to be a reasonably good lightning-protection tool for many years. There were several brand names; GE and Westinghouse made them, among others. Th gapped SiC arrester has been largely displaced by no-gap arresters that use columns of zinc oxide pellets.

Silicon carbide is used for blue LEDs, ultrafast, high-voltage Schottky diodes, MOSFETs and high temperature thyristors for high power switching. A famous paper by Jayan Baliga[2] shows enormous potential of SiC as a power device material. However, some problems with the interface of SiC with silicon dioxide has hampered the developme of SiC based power MOSFET and IGBTs. Extensive research is going on to solve the problem. Due to its high therma conductivity, SiC is also used as substrate for other semiconductor materials such as gallium nitride.[3] Due to its wide band gap, SiC-based parts are capable of operating at high temperature (over 350 °C), which together with good thermal conductivity of SiC reduces problems with cooling of power parts. They also possess increased tolerance to radiation damage, making it a material desired for defense and aerospace applications. Its main competitor is gallium nitride. Although diamond has an even higher band gap, SiC-based devices are easier to manufacture due to the fact that it is more convenient to grow an insulating layer of silicon dioxide on the surface of a silicon carbide wafer than i is with diamond.

Pure SiC is a poor electrical conductor. Addition of suitable dopants significantly enhances its conductivity. Typically such material has a negative temperature coefficient between room temperature and about 900 °C, and positive temperature coefficient at higher temperatures, making it suitable material for high temperature heating elements.

Silicon carbide is also used as an ultraviolet detector. Nikola Tesla, around the turn of the 20th century, performed a variety of experiments with carborundum. Electroluminescence of silicon carbide was observed by Captain Henry Joseph Round in 1907 and by O. V. Losev in the Soviet Union in 1923.[4]

### Structural material

In the 1980s and 1990s, silicon carbide was studied on several research programs for high-temperature gas turbines in the United States, Japan, and Europe. The components were intended to replace nickel superalloy turbine blades or nozzle vanes. However, none of these projects resulted in a production quantity, mainly because of its low impact resistance and its low fracture toughness.

### Astronomy

Silicon carbide's hardness and rigidity make it a desirable mirror material for astronomical work, although its propertie also make manufacturing and designing such mirrors quite difficult.

Silicon carbide may be a major component of the mantles of as-yet hypothetical carbon planets.

### Grit

Silicon carbide is a popular product in modern lapidary due to the durablility and low cost of the material. It is also used in coarse to fine grit sandpapers and as a grip tape in skateboards.

### Disc brake

Silicon-infiltrated carbon-carbon composite is used for high performance brake discs as it is able to withstand extreme temperatures. The silicon reacts with the graphite in the carbon-carbon composite to become silicon carbide. These discs are used on some sports cars, including the Porsche Carrera GT.

### Clutch

The Porsche Carrera GT has two plates made of silicon carbide as well.

### Diesel particulate filter

Silicon carbide is used in a sintered form for diesel particulate filters.

### Thin filament pyrometry

Silicon carbide fibers are used to measure gas temperatures in a diagnostic technique called thin filament pyrometry.

### Ceramic membrane

Silicon carbide is used for producing ceramic membranes for industrial processes, yielding high fluxes due to the sintering process.

### Cutting tools

In 1982 at the Oak Ridge National Laboratories, George Wei, Terry Tiegs, and Paul Becher discovered a composite of aluminium oxide and silicon carbide whiskers. This material proved to be exceptionally strong. Development of this laboratory-produced composite to a commercial product took only three years. In 1985, the first commercial cutting tools made from this alumina and silicon carbide whisker-reinforced composite were introduced by the Advanced Composite Materials Corporation (ACMC) and Greenleaf Corporation.

### Heating element

References to silicon carbide heating elements exist from the early 20th century when they were produced by Acheson's Carborundum Co. in the U.S. and EKL in Berlin. Silicon carbide offered increased operating temperatures compared with metallic heaters, although the operating temperature was limited initially by the water-cooled terminals which brought the electric current to the silicon carbide hot zone. The terminals were not attached to the hot zone, but were held in place by weights, or springs. Operating temperature and efficiency was later increased by the use of separate low resistance silicon carbide "cold ends", usually of a larger diameter than the hot zone, but still held in plac only by mechanical pressure. The development of reaction-bonding techniques led to the introduction of jointed elements. Initially, these featured larger diameter cold ends, but by the 1940s, equal diameter elements were being produced. From the 1960s onwards, one-piece elements were produced, with cold ends created by filling the pore volume with a silicon alloy. Another one-piece technique is to cut a spiral slot in a homogeneous tube where the hot section is desired. Further developments have included the production of multi-leg elements, where two or more legs are joined to a common bridge, and the production of high density, reaction-bonded elements, which provide additiona resistance to oxidation and chemical attack. Silicon carbide elements are used today in the melting of non-ferrous metals and glasses, heat treatment of metals, float glass production, production of ceramics and electronics components, etc.

### Nuclear Fuel

Silicon carbide is often used as a layer of the TRISO coating for the nuclear fuel elements of high temperature gas cooled reactors or very high temperature reactors such as the Pebble Bed Reactor.

### Jewel

As a jewel used in jewelry, silicon carbide is called **Moissanite** for the jewel's discoverer Dr. Henri Moissan[5]. Moissanite is somewhat similar to diamond in several important respects: it is transparent and hard (9, although a patent states 8.5-9.0,[6] -note on the Mohs scale compared to 10 for diamond), with a refractive index between 2.65 anc 2.69 (compared to 2.42 for diamond). Moissanite is somewhat harder than common cubic zirconia. Unlike diamond, Moissanite is strongly birefringent. This quality is desirable in some optical applications, but not in gemstones. For thi reason, Moissanite jewels are cut along the optic axis of the crystal to minimize birefringent effects. It is lighter (density 3.22 vs. 3.56), and much more resistant to heat. This results in a stone of higher lustre, sharper facets and goo resilience. Loose moissanite stones may be placed directly into ring moulds; unlike diamond, which burns at 800 °C, moissanite remains undamaged by temperatures up to twice the 900 °C melting point of 18k gold.

In 1998, Charles & Colvard introduced jewel-quality synthetic silicon carbide to the market under the name "moissanite". This gemstone possesses superior fire and brilliance to diamonds. Upon introduction, some jewelers misidentified moissanite as diamond. Moissanite's thermal conductivity is very close to that of diamond, rendering useless the older thermal testers that they relied upon. Moissanite has a slightly higher index of refraction (brilliance)

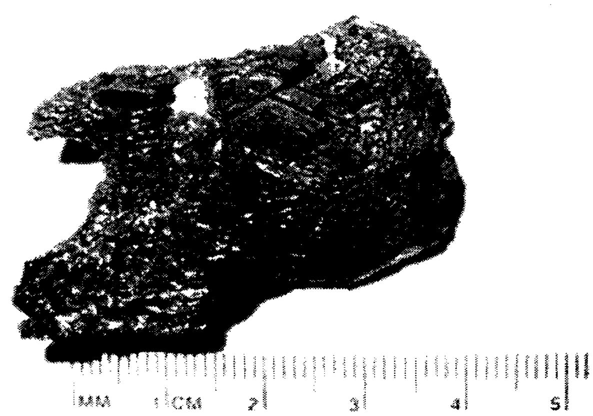
and much greater dispersion (fire) than diamond, as it shows many more "flashes" of color than a diamond. Unlike cubic zirconia and other diamond simulants, moissanite does not cloud over time, and is extremely durable.

Once its properties are known, moissanite is easy to distinguish from diamond, as it is doubly refractive and has a very slight green, yellow, or gray fluorescence under ultraviolet light. Because the brilliance of the moissanite helps to cancel the perceived color, cuts with higher brilliance tend to have a much "whiter appearance" (i.e., round brilliant, square brilliant, and cushion cut) versus cuts that have a lower refractive index such as the marquise, radiant and especially the pear-shaped cut. The color is often defined as "near colorless" which on the diamond color scale ranges from G through J.

Charles & Colvard markets moissanite primarily to self-purchasing women. However, moissanite engagement rings, eternity bands and circle pendants have become popular among value-conscious consumers. For example, a 1-carat (200 mg) moissanite gem sells for about $500 (2007 USD), while a diamond of similar size and color typically sells fc $4500 or more. Moissanite jewelry is sold at a wide variety of internet and retail outlets.

## Steel

Silicon carbide dissolved in a basic oxygen furnace used for making steel acts as a fuel and provides energy which increases the scrap to hot metal ratio.[7] It can also be used to raise tap temperatures and adjust the carbon content.


Piece of silicon carbide used in steel making

90% silicon carbide is used by the steel industry as a ladle deoxidizer, a source of silicon and carbon in the ladle, an electric furnace slag deoxidizer, and as a synthetic slag additive.[8] According to Miller and Company,[9] it costs less than ferrosilicon and carbon combination, produces cleaner steel due to low level of trace elements, it has a low gas content, it does not lower the temperature of steel, and it has an abundant world wide supply. The silicon carbide used as a steel additive or fuel comes as a granular product in either bulk and bags.

50% and 65% silicon carbide are used in the steel industry for processing steel and iron scrap. Typically supplied as blocks and made from silicon carbide crucible scrap, it helps extend the hot metal supply and raises the tap temperature.[10] The blocks are typically made using an automated concrete block making machine, and utilize water and limestone cement as a binder.

## Armour

Like some other hard ceramics (namely alumina and boron carbide), silicon carbide is used in composite armour (eg. Chobham armour), and in ceramic plates in bulletproof vests.

## Catalyst Support

The natural resistance to oxidation exhibited by silicon carbide, as well as the discovery of new ways to synthesize th higher surface area beta form, has led to significant interest in its use as a heterogeneous catalyst support. The beta cubic form has already been employed for several years as a catalyst support for the oxidation of C4 hydrocarbons, such as n-butane, to maleic anhydride.

## In popular culture

- In Edgar Rice Burroughs' Barsoom series, "carborundum" is used as building material for city walls.
- In 2001: A Space Odyssey and the related series of books and movies (by Arthur C. Clarke and Stanley Kubrick among others) the monoliths (or at least their exteriors) were made of silicon carbide
- In the *Discworld* novel *Monstrous Regiment*: Carborundum is the name of the Troll that enlists.
- In the movie Snatch, a pawn shop employee (Sol) determines a diamond is actually Moissanite, much to the dismay of the thief (Bad Boy Lincoln) who stole the ring.
- The name of the material is part of the pun "Illegitimi non carborundum" (Dog Latin for "don't let the bastards grind you down"), which figures into a football fight song of Harvard University among other things.
- In the BBC television show *Top Gear*, host Jeremy Clarkson expresses excitement over the mere mention of silicon carbide used in the brakes and clutch of the Porsche Carrera GT.

## Patents and trademarks

Edward Goodrich Acheson (1856–1931) patented the method for making silicon carbide powder on February 28, 189: On May 19, 1896, he was also issued a patent for an electrical furnace used to produce silicon carbide.[11] Carborundum is a trademark of Saint-Gobain Abrasives.

## See also

- Diamond simulant.
- Illegitimi non carborundum, mock-Latin using the trademark Carborundum as if it were a Latin verb gerund.

## References


1. ^ http://img.chem.ucl.ac.uk/www/kelly/history.htm
2. ^ Comparison of 6H-SiC, 3C-SiC, and Si for power devices, Bhatnagar, M., Baliga, B.J., IEEE Transactions on Electron Devices, March 1993
3. ^ http://www.qinetiq.com/home/commercial/information_communication_and_electronics/Electronics/optronics/quantum_ele
4. ^ http://www.indiana.edu/~hightech/fpd/papers/ELDs.html
5. ^ Moissanite Education (http://shopping.schubachstore.com/site/hosted-MOISSANITE-EDUCATION.htm)
6. ^ Patent #5,762,896 Espacenet record (http://v3.espacenet.com/textdoc?DB=EPODOC&IDX=US5762896&F=0)
7. ^ http://www.millerandco.com/products/briquettes_steel/
8. ^ http://www.millerandco.com/products/briquettes_steel/specifications/briq90.htm
9. ^ Miller and Company (http://www.millerandco.com/)
10. ^ http://www.millerandco.com/products/briquettes_steel/specifications/briq65.htm
11. ^ U.S. Patent 492,767 (http://patft.uspto.gov/netacgi/nph-Parser?patentnumber=492767) -- *Production of artificial crystalli carbonaceous material*


## References

^ Most in the jewelry industry may not recognize the 1/4 fractional intervals on the Mohs scale (a relative scale), and it is technically not correct since the Mohs scale only contains whole and half numbers. But the issuers of the patent u it in showing exactly where certain minerals are in relation to each other. On the original Mohs scale diamond was listed as a 10 and sapphire is listed as a 9. On an absolute scale, a diamonds hardness is between 5700–10400 on the Knoop scale, while a sapphire's hardness is 2000. The Knoop hardness of moissanite is 3000. This puts the Mohs

hardness of moissanite around 8.5–9.25—as stated here, 9 1/4 may not be recognized, but 8.5–9.25 is the number used in the patents.

## External links

- Moissanite Buyer's Guide (http://www.moissanite-buyers-guide.com/) How to buy moissanite jewelry.
- A Brief History of Silicon Carbide (http://img.chem.ucl.ac.uk/www/kelly/moissanite.htm) J F Kelly, University of London
- Material Safety Data Sheet (http://physchem.ox.ac.uk/MSDS/SI/silicon_carbide.html) for Silicon Carbide
- Mindat.org (http://www.mindat.org/min-2743.html)
- discovery of Moissanite by Moissan (http://www.farlang.com/gemstones/us-geol-survey-1905/page_040) Moissan studied Meteorites. George Frederick Kunz describes this discovery in USGS annual report.

Retrieved from "http://en.wikipedia.org/wiki/Silicon_carbide"

Categories: All articles with unsourced statements | Articles with unsourced statements since February 2007 | Carbides | Silicon compounds | Semiconductor materials | Superhard materials | Ceramic materials | Refractory materials | Gemstones | Synthetic minerals | Deoxidizers